

S/N: 09/834,141**PATENT
Docket No. RAL920000016US2****Listing of claims:**

1. (Currently Amended) A system for processing frames and enqueueing the frames on an output where the system serves users having different types of service, the system comprising:

a first calendar for serving users which have a first type of service;

a second calendar for serving users which have a second type of service;

a third calendar for serving users having a third type of service;

a first system algorithm which places frames a first pointer in the first calendar when the user has a first type of service;

a second system algorithm which places frames a second pointer in the second calendar when the user has a second type of service and is within the limits set by the user level of service;

a third system algorithm which places frames a third pointer in the third calendar when the user has selected that type of service and when the user has selected the second type of service but has exceeded the limits set for the second type of service; and

a fourth system algorithm which removes frames from ~~the calendars~~ flow queues according to stored logic.

2. (Currently Amended) A system for processing frames and enqueueing the frames on an output including the elements of Claim 1 wherein one type of service is a minimum bandwidth service and ~~the system further includes~~ a timer for providing periodic service to a flow which has a minimum bandwidth to allow the minimum bandwidth to be provided.

3. (Original) A system for processing frames and enqueueing them on an output including the elements of Claim 2 wherein, when a flow which has minimum bandwidth service exceeds the minimum bandwidth service, the excess of the minimum bandwidth may be handled by another service.

S/N: 09/834,141**PATENT
Docket No. RAL920000016US2**

4. (Currently Amended) A system for processing frames and enqueueing them on an output including the elements of Claim 1 wherein a service provides for a weighted fair queuing and ~~the system includes~~ing a mechanism which determines the priority in the calendar.
5. (Original) A system for processing frames and enqueueing them on an output including the elements of Claim 4 wherein the mechanism which determines the priority in a calendar includes a calculation which is based on the length of at least one frame from the flow.
6. (Previously Presented) A system for processing frames and enqueueing them on an output including the elements of Claim 1 and further including a first arrangement for providing minimum bandwidth service and a second arrangement for providing weighted fair queuing service.
7. (Currently Amended) A system for processing frames and enqueueing them on an output including the elements of Claim 1 and further including a first arrangement for providing minimum bandwidth service and a second arrangement for providing weighted fair queuing service and ~~the system further includes~~ing a service to provide weighted fair queuing service to a user who has minimum bandwidth service when the user exceeds the limits of the minimum bandwidth service.
8. (Previously Presented) A system for processing frames and enqueueing them on an output including the elements of Claim 1 and further including a first arrangement for providing minimum bandwidth service, a second arrangement for providing weighted fair queuing service and a third service which allows for best efforts service.

S/N: 09/834,141**PATENT
Docket No. RAL920000016US2**

9. (Original) A system for processing frames and enqueueing them on an output including the elements of Claim 8 wherein the weighted fair queuing service includes a mechanism for adjusting the priority of a user according to the length of frames for that user.

10. (Currently Amended) A method of placing processed frames on an output after processing and establishing and enforcing a system of different types of service levels, the method comprising the steps of:

- providing separate calendars for serving at least two separate types of services;
- establishing at least a first and second type of service, with one of the types of service having a limit on the bandwidth which can be used;
- identifying a type of service with each flow of processed frames, and, for a service having a limit on the bandwidth which can be used, the respective limit;
- establishing a logical priority in for the separate calendars serving the first and second types of service;
- allowing ~~service for~~ one of the separate calendars to provide the higher priority service for a user until the user reaches the limit on the bandwidth which can be used;
- serving the service for the lower priority service with another of the separate calendars when service for the higher priority service is not required; and
- treating requests for service from the higher priority service which exceed the limit on bandwidth which can be used to be considered as lower priority service requests.

11. (Original) A method of placing frames on the output and establishing and enforcing a system of different types of service levels including the steps of Claim 10 wherein the higher priority service includes a minimum bandwidth service up to an established bandwidth limit and a lower priority service is a best efforts service.

S/N: 09/834,141**PATENT
Docket No. RAL920000016US2**

12. (Original) A method of placing frames on the output and establishing and enforcing a system of different types of service including the steps of Claim 10 and further including the step of establishing a third type of service and allocating a priority to the third type of service.

13. (Original) A method of placing frames on the output and establishing and enforcing a system of different types of service including the steps of Claim 12 wherein the third type of service is a fair queuing system.

14. (Original) A method of placing frames on the output and establishing and enforcing a system of different types of service including the steps of Claim 13 wherein the third type of service includes a system for weighting the priorities of different users of the service.

15. (Original) A method of placing frames on the output and establishing and enforcing a system of different types of service including the steps of Claim 14 wherein the third type of service includes a weighting for the length of the frame.

16. (Canceled)

17. (Currently Amended) A system for processing frames and enqueueing the frames on an output where the system accommodates flows with different types of service including combinations of different types of service, the system comprising:

- a first calendar which supports a first service;

- a second calendar which supports a second service;

- logic which schedules frames onto the output from the first calendar and the second calendar, said logic including interaction between said first and second calendars to allow a single flow to be included simultaneously on both calendars and to determine when the flow is enqueued on the output.

S/N: 09/834,141**PATENT
Docket No. RAL920000016US2**

18. (Currently Amended) A system for processing frames including the elements of Claim 17 wherein the services are chosen from a group including minimum bandwidth, best effort, peak and maximum burst size, allowing a given flow to have both a minimum bandwidth service and best effort service, wherein the system includes the first calendar for servicing the minimum bandwidth and the second calendar for servicing the best effort and the logic places the given flow simultaneously in both calendars to determine when it must come out, given the minimum bandwidth service and the best effort service.

19. (Previously Presented) A method of processing frames and placing the processed frames from a plurality of flows onto an output based upon different types of service levels associated with the flows, the steps of the method comprising:

- establishing a first calendar to support a first type of service;

- establishing a second calendar to support a second type of service;

- determining the types of service which have been selected for a given flow and using the types of service to select the calendars which service the flow;

- using the calendars to determine the order in which processed frames from the flows are placed onto the output; and

- allowing a single flow to be placed simultaneously on the first and second calendar and serviced from both the first and second calendar by using logic to determine when a flow is serviced.

20. (Currently Amended) A method of processing frames including the steps of Claim 19 wherein the types of service include minimum bandwidth and best effort with a calendar to support each type of service and the step of determining the types of service include determining that a given flow has both minimum bandwidth and best effort and places the flow simultaneously in both the calendar for minimum bandwidth and the calendar for best effort.

S/N: 09/834,141**PATENT
Docket No. RAL920000016US2**

21. (Original) A method of processing frames including the steps of Claim 19 wherein the types of service include minimum bandwidth, best effort, peak and maximum burst size and the services include combinations of these types of service.

22. (Previously Presented) The system of claims 1 or 17 further including a plurality of flow queues operable to buffer list of frames wherein each flow queue has a predefined bandwidth specification associated with it.

23. (Currently Amended) The system of claim 22 wherein the bandwidth specification is part of a service level agreement between a service provider and user of a provided service.

24. (Currently Amended) The system of claims 1 or 17 wherein at least one of the first calendar and the second calendar includes n epochs wherein $n > 1$.

25. (Previously Presented) The system of claim 24 wherein $n = 4$.

26. (New) The system of claim 1 wherein the fourth system includes logic that detach selected pointer from selected ones of said calendar.

27. (New) A program product for use in a computer or like machine comprising:
a medium on which a computer program is recorded, said computer program including
a first module with instructions for placing at least a first pointer on a first calendar when a user has a first type of service;
a second module with instructions for placing at least a second pointer on a second calendar when the user has a second type of service and is in limits set by the user level of service;

S/N: 09/834,141**PATENT
Docket No. RAL920000016US2**

a third module with instructions for placing at least a third pointer on a third calendar when the user has selected that type of service and the second type of service but has exceeded the limits set for the second type of service, and

a fourth module with instructions to remove a frame from a flow queue identified by a pointer selected by stored logic.

28. (New) The program product of Claim 26 wherein the service includes minimum bandwidth service and best effort bandwidth service.